

"In The Name of God"

Test 3—1

8th Grade

Mathematics

February, 2008

Read every question carefully and answer the questions based on what you are asked.

Do not leave any question blank and show your work.

You may not leave the exam early; even if you are finished, review the test until the end of the designated time.

Show your work on the paper and make sure you write units.

Please do not ask any unnecessary questions during the test.

Alireza Shirazian

Part (I): Solve for x in the following equations

$$1) 27^{(1-2x)} = \frac{1}{9^{(2x-1)}}$$

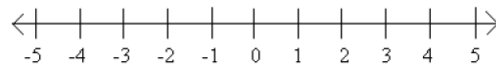
$$2) (1 - 2x)(3x - 2) + 6x^2 - x - 1 = 0$$

$$3) \sqrt[4]{6 - 2x} = 3 \times \sqrt[4]{\frac{x}{81}}$$

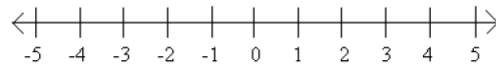
$$4) \frac{5xy - 2x + 2y}{(2x - 1)} = y + 1$$

Part(II): Solve and graph each of the following inequalities

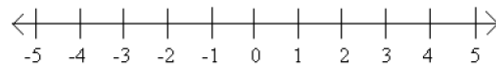
1) Solve and graph $\{x|3(2x - 2) \leq 6\} \cap \{x|-3(3 - x) < 5\}$



2) Solve and graph $\{x|-(x - 4) > 5\} \cup \{x|3x - 6 \geq -3\}$



3) Solve and graph $\left\{\left|\frac{-5-2x}{-5}\right| \geq -3\right\} \cap \{-x + 12 < 3\}$



Part(III): Simplify the following expressions

$$1) \left(\frac{(x+1)(x^2+x+1)}{(x^3-1)} \right)^2 \left(\frac{(x-1)(x^2-x+1)}{(x^3+1)} \right)^2 =$$

$$2) \left(\frac{x^{-3}y^3z^{-3}}{x^3y^{-3}z^0} \right)^{-2} =$$

$$3) \frac{\sqrt[3]{x^2y} \cdot x^{\left(\frac{1}{3}\right)} \cdot \sqrt[7]{z^4} \cdot z^{\left(\frac{6}{7}\right)}}{\sqrt[6]{x^3y} \cdot y^{\left(\frac{1}{6}\right)}} =$$

$$4) \frac{36x^2-2^4}{6x-4} + \frac{4x^2+2x-6}{2x-2} =$$

Part(IV): Solve and rationalize

1) Solve the following system of linear equations:
$$\begin{cases} 5x + 3y + 2z = 21 \\ x + 3y + 4z = 15 \\ 3x + 4y + z = 19 \end{cases}$$

2)
$$\frac{1}{3+2\sqrt{2}} + \frac{1}{2\sqrt{2}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{5}} + \frac{1}{\sqrt{5}+2} + \frac{1}{2+\sqrt{3}} =$$

Part(V): Factoring/Multiplying polynomials

1) $x^4 + x^3 + x - 1 =$

2) $y^3 - 2y^2 - y + 2 =$

3) $2x^2 + 7x + 6 =$

4) $2x^3 + 2x^2 - 60x =$

5) $y^4 + 4 =$

6) Divide and find the remainder:

$$(2x^3 + 4x + 3) \div (x - 2)$$

7) Divide and find the remainder if any:

$$(6y^4 - 9y^3 - y^2 + 6y - 2) \div (3y^2 - 2)$$

Extra Credit:

Factor/Simplify as many as you can!

1) $2x^3 - \frac{1}{4} =$

2) $4x^2 - y^2 - 2y - 1 =$

3) $x^4 + x^3 + x^2 + 4x + 3 =$

4) $x^8 - 5x^4 + 4 =$

5) $\frac{x^4 - x^3 - x + 1}{x^4 + x^2 + 1}$